

Remarks

Reconsideration and withdrawal of the rejection set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 34-37 remain pending in the application, with Claim 34 being independent. Claim 34 has been amended herein.

Claims 34-37 were rejected under 35 U.S.C. § 103 as being unpatentable over Japanese Laid-Open Patent Application No. 9-174847 (Izumida) in view of U.S. Patent No. 5,736,994 (Takahashi). This rejection is respectfully traversed.

As is recited in independent Claim 34, the present invention relates to an image printing apparatus for driving a plurality of blocks by using a plurality of divided periods by time division to print an image, with each block having a predetermined number of printing elements grouped from a plurality of printing elements. The apparatus includes first and second driving means and image printing means. The first driving means drives the plurality of blocks by time division by supplying a main pulse for discharging ink from printing elements of a block every divided period. The second driving means selects blocks to drive, a number of which is less than a total number of blocks, and drives each of the selected blocks to drive by time division by supplying a main pulse for discharging ink from printing elements of a block during one of the divided periods, and supplying at least one preheating pulse for preheating the printing elements of the block but not to discharge ink during at least one other of the divided periods. The image printing means selects

either one of the first and second driving means, and prints the image using the selected driving means.

With the above arrangement, using the first driving means, all blocks can be driven by time division and a divided period is used to make one dot. With the second driving means, however, blocks to drive are selected, the number of which is less than the total number of blocks, and each of the selected blocks is driven by time division by supplying a main pulse during one of the divided periods and supplying at least one preheating pulse for preheating the printing elements of a block, but not to discharge ink during at least one other of the divided periods. That is, the second driving means of each of the selected blocks can be driven by time division and more than one divided period is used to make one dot pulse. As a result, the width of the dot pulse signal from the second driving means can be greater than that from the first driving means.

The second driving means can be selected to increase the discharging ink amount per printing element by extending the time period of the dot pulse signal to use a plurality of pulses including preheating and main pulses. The second driving means can be used at higher temperatures. The image printing apparatus can perform high-quality, high efficiency printing by optimizing the number of blocks for discharging ink and the ink discharge amount by selecting the first or second driving means based on the print head temperature, for example. The features of Claim 34 are supported at least in the specification at pages 26-32 and by Figures 1A -2C.

Izumida relates to a recorder that divides the recording head into eight blocks and divides one cycle of the recording operation into nine time zones. The pre-

pulse and main pulse are applied to recording elements of the same block over two divided time zones, as shown in Figure 7, for example. However, Izumida does not disclose or suggest at least first driving means for driving the plurality of blocks by time division by supplying a main pulse for discharging ink from printing elements of a block every divided period, as recited in independent Claim 34. Note, for example, that no main pulse is applied during period 1 in Izumida. Nor does Izumida disclose second driving means for selecting blocks to drive, a number of which is less than a total number of blocks, and driving each of the selected blocks to drive by time division by supplying a main pulse for discharging ink from printing elements of a block during one of the divided periods, and supplying at least one preheating pulse during at least one other of the divided periods, much less image printing means for selecting either one of the first and second driving means.

Thus, Izumida fails to disclose or suggest important features of the present invention recited in independent Claim 34.

Takahashi relates to an ink jet apparatus and driving method that uses first and second drive waveforms depending on the ambient temperature. The first drive waveform includes a main pulse signal and the second drive waveform includes a main pulse and a pre-pulse. However, Takahashi does not disclose or suggest selecting blocks to drive. Thus, Takahashi fails to remedy the deficiencies of Izumida noted above with respect to independent Claim 34. Moreover, even assuming, *arguendo*, that Izumida could be modified by Takahashi, Applicant respectfully submits that the feature of Izumida utilizing a main pulse during one divided period and a pre-pulse during another divided

period would be replaced with feature utilizing main pulses, the number of which would be equal to the double pulses of Izumida. There is no disclosure or suggestion in either citation such that the resulting combination would select blocks to drive, a number of which is less than a total number of blocks, and driving each of the selected blocks.

Thus, independent Claim 34 is patentable over the citations of record.

Reconsideration and withdrawal of the § 103 rejection are respectfully requested.

For the foregoing reasons, Applicant respectfully submits that the present invention is patentably defined by independent Claim 34. Dependent Claims 35-37 are also allowable, in their own right, for defining features of the present invention in addition to those recited in their respective independent claims. Individual consideration of the dependent claims is requested.

Applicant submits that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejection set forth in the above-noted Office Action, and an early Notice of Allowability are requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Mark A. Williamson', with a long horizontal flourish extending to the right.

Mark A. Williamson
Attorney for Applicant
Registration No. 33,628

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200
MAW\tnt

DC_MAIN 175311v1